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REMARKS/ARGUMENTS

Disposition of the Claims

This response is intended to be a full and complete response to the non-final Office Action mailed February 10, 2006. Claims 9 to 24, as amended, and newly added claims 25 to 27 are pending in the present application.

Amendments to the Specification

Applicants have amended page 5 of the specification as filed to correct a typographical error. In the original filing, various patent references disclosing known methods of making block copolymers are listed, including WO 04/22931. However, as can be seen by reviewing this reference (the first page attached hereto as Appendix I for the convenience of the Examiner), the reference has nothing to do with the subject matter of the present application, block copolymers. WO 04/22931 instead deals with active vent noise reduction devices for use with an exhaust or intake valve. On the other hand, WO 94/22931 deals with a process for the preparation of a block copolymer composition and block copolymer compositions (the first page attached hereto as Appendix II for the convenience of the Examiner), in line with the subject matter of the present invention. This error was inadvertent and Applicants apologize for any inconvenience it may have caused. Accordingly, Applicants respectfully request entry of the above noted amendment to the application and consideration of the application in view of this amendment.

Amendments to the Claims

In the original preliminary amendment, Claims 1 to 8 were canceled and rewritten as newly added Claims 9 to 24 in order to place said claims in a more acceptable format for consideration.

In the present response, Claims 9 and 24 have been amended to have the vinyl content and molecular weight set forth in the claims correspond more closely to the examples of the present invention. Support for these amendments may be found in the examples of the current specification (more specifically in the sections on Examples 1 to 4 and Examples 5 to 6). In addition, Claims 25 to 27, which are dependent claims in

which the vinyl content is from 8 to 60 % have been added. Support for these claims may also be found in the examples of the specification.

35 U.S.C. § 103(a) Rejection

The Examiner has rejected claims 9 to 24 under 35 U.S.C. § 103(a) as being unpatentable over Fujiwara et al, U.S. Patent No. 6,833,411 (hereinafter "Fujiwara et al") in view of Heimerikx et al, U.S. Patent No. 6,949,593 (hereinafter "Himerikx et al"). This rejection is respectfully traversed with regard to Claims 9 to 24, as amended, and newly added claims 25 to 27.

Fujiwara et al disclose an asphalt composition claiming "high-temperature storage stability and low temperature characteristics and having an excellent balance among properties". See abstract of Fujiwara et al. For purposes of the effective date of the reference, the date to be considered for Fujiwara et al is August 6, 2002, the date on which the PCT application was filed. Applicants herewith submit an Affidavit under 37 CFR 131 (attached hereto as Appendix III) antedating the reference cited by the Examiner in which Applicants attest to the completion of the present invention prior to this date. Applicants note that along with the date on this document, the information not necessary to show completion of the invention has been redacted. Accordingly, Applicants maintain that Fujiwara et al is not an appropriate reference for purposes of the present rejection.

Even if Fujiwara et al were considered an appropriate reference, Applicants still maintain that the claims of the present application are patentable over Fujiwara et al in view of Heimerikx et al. In the present invention Applicants have identified a particular bituminous composition which surprisingly 1) shows significant less viscosity increase during long term storage at 180°C or higher; 2) is better manageable after hot storage; and 3) shows significantly less gelation even after 144 hours. The composition comprises a bituminous component and a specific block copolymer. The specific block copolymer has at least two terminal vinyl aromatic blocks and at least one central conjugated diene block that is obtained by substantially random copolymerization of butadiene and

isoprene in a molar ratio of butadiene to isoprene from 1:2 to 9:1. The vinyl aromatic content of the block copolymer is from 20 to 30 wt%, the vinyl content is from 8 to 80% and the apparent molecular weight of the complete block copolymer is from 310,000 to 500,000. In addition, when diblock is present, it is present in an amount of at most 25 mole%. It is the combination of these parameters in the block copolymer which provide the surprising advantages seen when combined with the bitumen component.

Fujiwara et al disclose an asphalt composition having high-temperature storage stability and low temperature characteristics. It should be noted that Fujiwara et al disclose block copolymers for resin compositions and for asphalt compositions. However, in the Fujiwara et al patent, only five of the block copolymers are used as examples in bituminous compositions. These five include polymers 1 (Example 1 of Table 2), 2 (Example 2 of Table 2), 6 (Example 3 of Table 2), 7 (Example 4 of Table 2) and 8 (Example 5 of Table 2). Each of these polymers has a polystyrene content of 30 wt% and a vinyl content that ranges from 13 to 18 %. The isoprene to butadiene weight ratio of the individual examples are 20/80, 35/65, 35/65, 41.5/58.5 and 43.5/56.5, respectively. The number average molecular weights of the polymers are 100,000, 120,000, 140,000, 120,000 and 150,000, respectively. Of the examples utilized, only polymers 6 and 8 have a diblock content; which is in each case 30%.

The most significant difference between the polymers of the present invention with those used in the asphalt compositions of Fujiwara et al is that the bituminous compositions of the present invention require a much higher molecular weight than those used in the examples of Fujiwara et al. In the present invention, the apparent molecular weight of the complete block copolymer is in the range of from 310,000 to 500,000. While Claim 1 of Fujiwara et al does disclose a molecular weight range from 30,000 to 500,000, there is no disclosure whatsoever that polymers larger than 200,000 have been made or that they will in fact work to achieve the properties that Fujiwara et al claim. Also, there is no teaching or suggestion that the diblock content should be less than 30%. Indeed, polymers 6 and 8 rather show that the inventors had a diblock greater than 25% in mind.

Heimerikx et al is directed to the use of an additive, most preferably IRGANOX MD-1024, in a bituminous composition. The examples in this patent are carried out with KRATON D-1184, a commercial SBS grade with an apparent molecular weight of 420,000. Note that Heimerikx et al is silent on the use of a block copolymer having a midblock made by substantially random copolymerization of butadiene and isoprene.

Since the polymers used in Fujiwara et al and Heimerikx et al are so different, it is difficult to see how one skilled in the art considering the teachings of Fujiwara et al would be led to combine that reference with Heimerikx et al and conclude that there should be diblock present in Fujiwara et al. If anything, Applicants maintain that one skilled in the art would be led to add MD-1024 to the bituminous compositions of Examples 1 to 5 of Fujiwara et al. Even so, such a combination would not lead to a bituminous composition as presently claimed. Next, even if one were to combine the two references, the Heimerikx et al reference does not overcome the deficiencies of Fujiwara et al which teaches the use of block copolymers at a lower molecular weight (less than 200,000) in asphalt. The problem underlying the present invention concerns hot storage stability and the need to avoid gel formation without adversely affecting other properties such as ring and ball; flow resistance and cold bend. The present invention clearly shows that these problems are surprisingly addressed when using the block copolymers of the present invention.

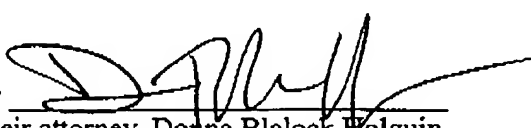
In view of the above arguments, Applicants maintain that Claims 9 to 24, as amended, and newly added claims 25 to 27 of the present invention, are patentable over Fujiwara et al in view of Heimerikx et al and respectfully request that the rejection of these claims under 35 U.S.C. § 103(a) be withdrawn and the claims be allowed.

Conclusion

Applicants maintain that Claims 9 to 24, as amended, and newly added claims 25 to 27 are now in condition for allowance. Reconsideration of the claims and withdrawal of the 35 U.S.C. § 103(a) rejection are requested. Allowance of the claims is earnestly solicited.

Respectfully submitted,

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Appendix I

(12) DEMANDE INTERNATIONALE PUBLIÉE EN VERTU DU TRAITÉ DE COOPÉRATION
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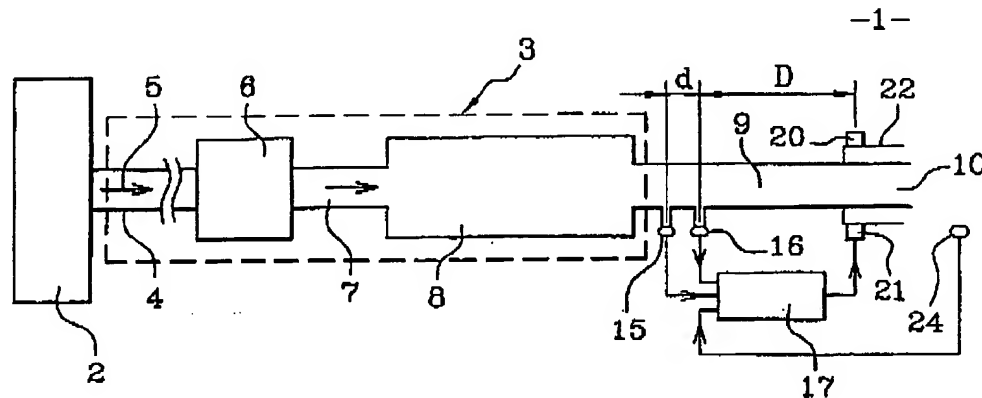
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[Suite sur la page suivante]

(54) Title: ACTIVE VENT NOISE REDUCTION DEVICE FOR USE WITH AN EXHAUST OR INTAKE PIPE

(54) Titre : DISPOSITIF ACTIF D'ATTÉNUATION DU BRUIT DE BOUCHE AU NIVEAU D'UN CONDUIT D'ÉCHAPPEMENT OU D'ADMISSION



(57) Abstract: The invention relates to a device for reducing the vent noise generated at an exhaust (9) or intake (39) pipe which is connected to a pulsed flow source (2) such as a heat engine (2) or a reciprocating compressor. The invention is characterised in that it comprises at least two sensors (15, 16) which are disposed inside the pipe (9) between the end (10) of the pipe (9) and the pulsed flow source (2) and which are shifted spatially in relation to one another, electronic means (17) of processing the signals from said sensors (15, 16) which can generate signals corresponding to a counternoise wave, and at least one electro-acoustic source (20, 21) which is disposed outside the pipe (9) but in direct proximity to the end (10) thereof and which is controlled by the signals corresponding to the counternoise wave.

(57) Abrégé : Dispositif d'atténuation du bruit de bouche généré au niveau d'un conduit d'échappement (9) ou d'admission (39) relié à une source d'écoulement pulsée (2) tel qu'un moteur thermique (2) ou un compresseur alternatif caractérisé en ce qu'il comporte au moins deux capteurs (15) (16) disposés à l'intérieur du conduit (9), entre l'extrémité (10) dudit conduit (9) et la source d'écoulement pulsée (2) et décalés spatialement l'un par rapport à l'autre; des moyens électroniques de traitement (17) des signaux issus desdits capteurs (15) (16), aptes à générer des signaux correspondant à une

[Suite sur la page suivante]

WO 2004/022931 A1

Appendix II



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WORLD INTELLECTUAL PROPERTY ORGANIZATION
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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁵ : C08F 297/04, C08L 53/02		A1	(11) International Publication Number: WO 94/22931 (43) International Publication Date: 13 October 1994 (13.10.94)
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(54) Title: PROCESS FOR THE PREPARATION OF A BLOCK COPOLYMER COMPOSITION AND BLOCK COPOLYMER COMPOSITION			
(57) Abstract			
<p>A process is provided for preparing block copolymer compositions, which process comprises the subsequent steps of: (1) polymerizing vinyl aromatic monomer in an inert hydrocarbon solvent in the presence of an organolithium initiator until substantially complete conversion; (2) adding conjugated diene monomer to the polymerization mixture and allowing said conjugated diene monomer to polymerize until substantially complete conversion; (3) adding a second portion of organolithium initiator, followed by the addition of a second portion of conjugated diene monomer and allowing said conjugated diene monomer to polymerize until substantially complete conversion; (4) adding a second portion of vinyl aromatic monomer and allowing said vinyl aromatic monomer to polymerize until substantially complete conversion; and (5) adding a terminating agent. Furthermore, a block copolymer composition is provided comprising: (i) a triblock copolymer A-B-B'-A' having two different or equal polymer endblocks A and A' derived from vinyl aromatic monomer and one polymer midblock B-B' derived from conjugated diene monomer, and (ii) a diblock copolymer B'-A' having one polymer block B' derived from conjugated diene monomer and one polymer block A' derived from vinyl aromatic monomer, wherein the molar weight ratio A' (triblock)/A' (diblock) is in the range of from 0.9 to 1.1, wherein both block copolymers are obtained by sequential polymerization and wherein the triblock copolymer as well as the diblock copolymer have a vinyl aromatic content of 55 % by weight or less based on the total weight of the triblock copolymer and diblock copolymer, respectively.</p>			